UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCES

Note to Reader
January 15, 1998

Background: As part of its effort to involve the public in the implementation of the Food Quality Protection Act of 1996 (FQPA), which is designed to ensure that the United States continues to have the safest and most abundant food supply. EPA is undertaking an effort to open public dockets on the organophosphate pesticides. These dockets will make available to all interested parties documents that were developed as part of the U.S. Environmental Protection Agency's process for making reregistration eligibility decisions and tolerance reassessments consistent with FQPA. The dockets include preliminary health assessments and, where available, ecological risk assessments conducted by EPA, rebuttals or corrections to the risk assessments submitted by chemical registrants, and the Agency's response to the registrants' submissions.

The analyses contained in this docket are preliminary in nature and represent the information available to EPA at the time they were prepared. Additional information may have been submitted to EPA which has not yet been incorporated into these analyses, and registrants or others may be developing relevant information. It's common and appropriate that new information and analyses will be used to revise and refine the evaluations contained in these dockets to make them more comprehensive and realistic. The Agency cautions against premature conclusions based on these preliminary assessments and against any use of information contained in these documents out of their full context. Throughout this process, If unacceptable risks are identified, EPA will act to reduce or eliminate the risks.

There is a 60 day comment period in which the public and all interested parties are invited to submit comments on the information in this docket. Comments should directly relate to this organophosphate and to the information and issues available in the information docket. Once the comment period closes, EPA will review all comments and revise the risk assessments, as necessary.

These preliminary risk assessments represent an early stage in the process by which EPA is evaluating the regulatory requirements applicable to existing pesticides. Through this opportunity for notice and comment, the Agency hopes to advance the openness and scientific soundness underpinning its decisions. This process is designed to assure that America continues to enjoy the safest and most abundant food supply. Through implementation of EPA's tolerance reassessment program under the Food Quality Protection Act, the food supply will become even safer. Leading health experts recommend that all people eat a wide variety of foods, including at least five servings of fruits and vegetables a day.

Note: This sheet is provided to help the reader understand how refined and developed the pesticide file is as of the date prepared, what if any changes have occurred recently, and what new information, if any, is expected to be included in the analysis before decisions are made. **It is not meant to be a summary of all current information regarding the chemical.** Rather, the sheet provides some context to better understand the substantive material in the docket (RED chapters, registrant rebuttals, Agency responses to rebuttals, etc.) for this pesticide.

Further, in some cases, differences may be noted between the RED chapters and the Agency's comprehensive reports on the hazard identification information and safety factors for all organophosphates. In these cases, information in the comprehensive reports is the most current and will, barring the submission of more data that the Agency finds useful, be used in the risk assessments.

Jack E. Housenger, Acting Director
Special Review and Reregistration Division

/OPP#

U. S. ENVIRONMENTAL PROTECTION AGENCY
Washington, D.C. 20460

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November 17,1998

MEMORANDUM

SUBJECT: EFED RED Chapter for **azinphos methyl**
PC Code No. 058001 ; Case No. 0234
DP Bar codes ~~D237285~~, D234029, D234030
D234006

RECEIVED
DEC 23
OPP PUBLIC DOCKET

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Reregistration Branch 2
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THROUGH: Betsy Grim, Acting Branch Chief of ERB 2 11-18-98
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This memo summarizes the attached EFED Environmental Risk Assessment and characterization for azinphos methyl. EFED has a high certainty that azinphos methyl poses a very high risk to aquatic organisms and could potentially be the highest. The assessment identified the following major issues of concern:

- All uses of azinphos methyl pose a high acute and chronic risk to aquatic animals. This is supported by copious amounts of incident data showing fish kills;
- All uses of azinphos methyl pose a high acute and chronic risk to terrestrial animals;
- Azinphos methyl has a high potential to reach surface water through both spray drift and run off and moves in the dissolved phase of runoff.
- Of the major organophosphates applied foliarly, azinphos methyl is one of the most persistent.
- Under some conditions, particularly karst topography (ex. caves, sink holes) azinphos methyl may contaminate groundwater, impacting both human health (acute risks) and

aquatic organisms.

Use Characterization

The environmental risk assessment is based on the following use information for azinphos methyl:

This assessment has been focused on the dominant uses of azinphos methyl. For the aquatic assessment, the uses assessed were almonds, apples, cherries, cotton, filberts, peaches, pears, plums/prunes, potatoes, sugar cane and walnuts. The apple assessment also covers the minor crop crab apples as the use patterns are identical. The major uses and most of the minor uses were assessed in the terrestrial assessment.

Azinphos methyl is highly used in the Mississippi Delta, the Blue Ridge Mountains, the Texas Panhandle, and central Washington, the Central Valley of California and Michigan.

Water Resources Assessment

Azinphos methyl is mobile (K_f = 12-27) and can reach surface water dissolved in runoff. While azinphos methyl is moderately persistent (with aerobic soil metabolism DT_{50} of 27 d.), it is not likely to leach into ground water under most use conditions. There is, however, limited data suggesting movement to ground water in karst terrain.

- Azinphos methyl can be expected to move to surface water via runoff and spray drift.

- The estimated concentrations of azinphos methyl in ground water sources of drinking water, based on SCI-GROW and monitoring data, were 75 ug/L for acute and 0.44 ug/L for chronic.

- Estimated concentrations of azinphos methyl in surface-water sources of drinking water (DWEC) were based on a Tier 2 assessment for cotton using PRZM and EXAMS. The DWECs were 88 ug/L for acute risk and 13.4 ug/L for chronic risk. In moderate to high use areas there were a few surface water detects; however, the monitoring data was of poor quality. The DWLOCs for acute exposure to azinphos methyl in drinking water were set at zero, because the acute exposure residues from food alone exceed the level of concern. Therefore, no level of exposure to azinphos methyl in drinking water was acceptable. The contribution to acute dietary risk from drinking water may need to be revisited since Bayer is submitting a revised MonteCarlo analysis, which they indicate lowers the level of concern to acceptable levels for food alone.

Ecological Risk Characterization

Based on fish kills and known LC50 values, azinphos methyl exceeds acute and chronic levels of concern for aquatic and terrestrial organisms at all use sites . Based on the number and magnitude of incidents in EFED's Incident Data Base System, there is considerable documentation that

azinphos methyl kills aquatic organisms when applied at registered use sites, especially sugar cane and cotton. Under labeled uses there are more adverse incident data for aquatic environments (fish kills) associated with azinphos methyl than for any other chemical in the EFED Incident Data Base System (approximately 50% of the database concerns azinphos methyl). A summary of the aquatic fish kills associated with azinphos methyl is provided in Table 1. Note than while most of these incidents can be very closely tied to azinphos methyl, some of these incidents had multiple stressors present including other pesticides, and low dissolved oxygen content. In a few cases, the incident could be traced to accident or misuse of the chemical.

Table 1. Summary of Aquatic fish kills associated with azinphos methyl

State	Years	Number	Crops	Number Killed*
Arkansas	1996	2	forestry, accident	NR
California	1973, 1993	3	alfalfa, almonds, walnuts	up to 2000
Florida	1994	1	citrus	1500
Georgia	1987, 1990	90	mostly cotton	total of 100,000
Louisiana	1991-1996	36	mostly sugarcane	up to 200,000
Mississippi	1993	2	cotton	up to 5000
Missouri	1994-1996	2	apples, peaches	325
New York	1970,1977	2	NR	NR
North Carolina	1990	1	apples	NR
Tennessee	1994-1995	2	cotton	NR
Texas	1993	1	cotton	40
Washington	1993	1	NR	NR

NR - not reported
* number killed is for the largest incident in each state except Georgia, which the total from 88 incidents caused during the Boll Weevil Eradication Program in 1987.

Kills of birds and reptiles have also been reported with azinphos methyl use. Mortality for birds and small mammals was demonstrated in terrestrial field and pen studies. These results are supported by exceedance of levels of concern for acute risks to birds and small mammals. Exceedance of the chronic levels of concern for birds and small mammals for the major use sites suggests adverse reproductive effects are highly likely when these animals are exposed to

repeated sublethal doses. Reproduction might also be impacted due to behavioral effects (e.g., nest desertion) on adults and subsequent starvation or predation of unattended eggs and nestlings. Concern for insect pollinators also is warranted based on the high toxicity of azinphos methyl to honey bees. Additionally, EFED is concerned about potential secondary toxicity to animals scavenging dead fish and aquatic invertebrates; scavenging by birds and other terrestrial organisms has been observed at fish kills.

Data Gaps

Environmental Fate:

o An aerobic aquatic metabolism study is not required but would substantially improve the quality of the modeling estimates.

o The field dissipation studies (from California) were marginal and there were no field dissipation studies for the southeastern U.S.. We recommend that field dissipation studies be conducted for the west coast and the southeast. The value of studies for the west coast is moderate but the value of studies for the south east is high.

o Because of the substantial concern and uncertainty in the ground water assessment in karst terrain, a ground water monitoring study should be conducted, unless these areas are restricted from the label. The value of this information is high, especially with regard to human health drinking water concerns.

o In a proposed Data Call In, 4/11/92, EFED requested that the registrant provide information addressing the formation/fate/transport of degradates containing the organophosphate moiety (the toxic moiety) in Hydrolysis (161-1), Photodegradation in Water/on Soil (161-2/-3), Aerobic/Anaerobic Soil Metabolism (162-1/-2) processes and their Mobility in Soil (163-1). The information was requested because this toxic moiety was not assessed in the original fate studies submitted to the Agency. However, due to the high certainty of aquatic and terrestrial impacts based on incidents, the additional data would not be of high value to EFED. The results would potentially only indicate an increased level of exposure to the environment of the toxic moiety.

Ecological Effects:

The ecological toxicity data base is complete except for:

o Freshwater fish early life stage study (MRID# 40098001) - this study may be upgraded to core and the guideline requirement fulfilled by submitting the raw water quality data, fish growth data, and offspring for the control group.

o Estuarine fish life cycle test study (MRID # 42021601) - this study may be upgraded to core and the guideline requirement fulfilled by submitting the raw water quality data, fish growth data, and offspring for the control group.